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中華民國經濟部智慧財產局

INTELLECTUAL PROPERTY OFFICE
MINISTRY OF ECONOMIC AFFAIRS
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其申請資料如下：

This is to certify that annexed is a true copy from the records of this
office of the application as originally filed which is identified hereunder:

申請日：西元 2000 年 03 月 17 日
Application Date

申請案號：089104912
Application No.

申請人：明碁電腦股份有限公司
Applicant(s)

局長
Director General

陳明邦

發文日期：西元 2000 年 9 月 18 日
Issue Date

發文字號：08911013003
Serial No.

申請日期：	89.3.17	案號：	89104912
類別：			

(以上各欄由本局填註)

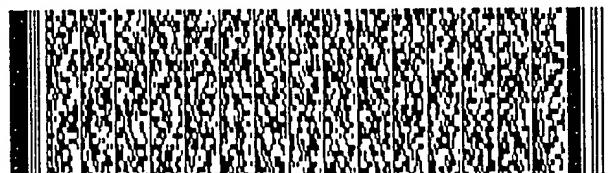
發明專利說明書

一、 發明名稱	中文	具有自我測試電路之顯示器
	英文	
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四、中文發明摘要 (發明之名稱：具有自我測試電路之顯示器)

英文發明摘要 (發明之名稱：)



四、中文發明摘要 (發明之名稱：具有自我測試電路之顯示器)

該電腦主機所傳來之影像畫面信號時，該偵測電路會開啟該開關電路而使該測試信號產生器所產生之測試信號得以傳入該顯示電路。

英文發明摘要 (發明之名稱：)



本案已向

國(地區)申請專利

申請日期

案號

主張優先權

無

有關微生物已寄存於

寄存日期

寄存號碼

無

五、發明說明 (1)

本發明係提供一種顯示器，尤指一種具有自我測試電路之顯示器。

習知顯示器是利用其螢幕顯示 (On Screen Display) 功能以及一微控制器 (micro-controller) 來進行自我測試。當使用者想要知道其顯示器是否可以正常運作時，使用者可以將該顯示器不連接於一電腦主機，如果顯示器可以成功顯示一信號，如 "no signal"，以表示其沒有接收到該電腦主機所傳來的影像畫面信號，則表示該顯示器可以正常運作。

當該顯示器沒有連接於該電腦主機，該顯示器的微控制器就無法接收從該電腦主機所傳來的影像畫面信號，因此該微控制器會啟動該顯示器的螢幕顯示功能，以在螢幕上顯示一信號，如 "no signal"。如果該顯示器可以成功顯示該信號，則表示該顯示器可以正常運作。反之，則表示該顯示器故障。

然而，有些顯示器並不具有螢幕顯示功能或是微控制器，因此無法進行自我測試。也就是說，如果一顯示器沒同時具有螢幕顯示功能以及微控制器，就不具有自我測試的功能。

因此，本發明之主要目的在於提供一種具有自我測試



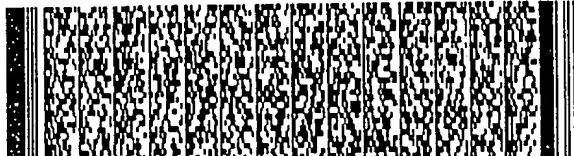
五、發明說明 (2)

電路之顯示器，其不需要包含有螢幕顯示功能以及微控制器，就能達到自我測試的功能。

請參考圖一。圖一為本發明顯示器 10 之功能方塊圖。顯示器 10 包含有一顯示幕 12，用來顯示影像畫面，一顯示電路 14，用來將一電腦主機 16 所傳來之影像畫面信號依序轉換成相對應之水平影像掃瞄線，以形成一相對應影像畫面並將其顯示於顯示幕 12 上，一自我測試電路 20，電連接於顯示電路 14 之輸入端，用來進行自我測試之功能，以及一連接裝置 18，電連接於自我測試電路 20 之輸入端，用來接收電腦主機 16 所傳來之影像畫面信號。而顯示電路 14 於水平掃瞄期間準備顯示每一條水平影像掃瞄線時，必須依據一 H-BLANK 信號來決定何時才可將該水平影像掃瞄線顯示於顯示幕 12 上，以使複數條水平影像掃瞄線得以形成一相對應之影像畫面。

請參考圖二。圖二為連接裝置 18 及其接腳定義之示意圖。本發明之連接裝置 18 可為一 D15 連接器，其中十五根接腳之定義如圖所顯示。電腦主機 16 所傳來之影像畫面信號為 IBM VGA 信號，其內含有一 EPS1 子信號，而連接裝置 18 對應於該 EPS1 子信號之接腳為圖二所顯示第五根接腳之 EPS1 接腳。

請參考圖三。圖三為圖一自我測試電路 20 之示意圖。



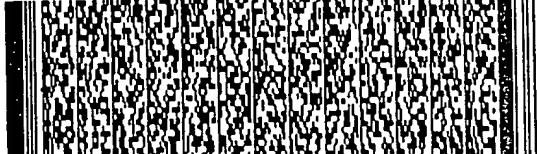
五、發明說明 (3)

自我測試電路 20包含有一測試信號產生器 22，用來產生一可測試顯示器 10的測試信號，一開關電路 24，電連接於測試信號產生器 22之輸出端與顯示電路 14之輸入端之間，用來控制該測試信號之輸出，以及一偵測電路 26，電連接於開關電路 24之控制端 32，用來偵測電腦主機 16是否有傳來影像畫面信號，以控制開關電路 24之開啟或關閉。

當偵測電路 26偵測到電腦主機 16所傳來之影像畫面信號 (IBM VGA信號) 時，偵測電路 26會關閉開關電路 24，使得測試信號產生器 22所產生之測試信號無法經由開關電路 24而輸出至顯示電路 14之輸入端。連接裝置 18會將電腦主機 16所傳來之影像畫面信號輸入顯示電路 14，而顯示電路 14會將該影像畫面信號轉換成一影像畫面，並將其顯示於顯示幕 12上。

當偵測電路 26偵測不到電腦主機 16所傳來之影像畫面信號時，偵測電路 26會開啟開關電路 24，使得測試信號產生器 22所產生之測試信號可以經由開關電路 24而傳入顯示電路 14，而顯示電路 14會將該測試信號轉換成一測試畫面，並且將其顯示於顯示幕 12上。例如，當該測試畫面呈一全白畫面 (full-white picture)，即表示顯示器 10可以正常運作。反之，則表示顯示器 10故障。

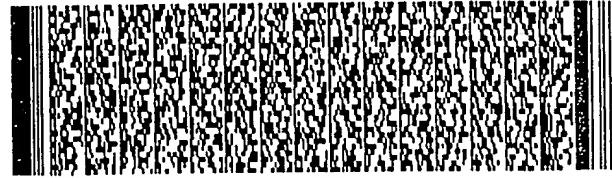
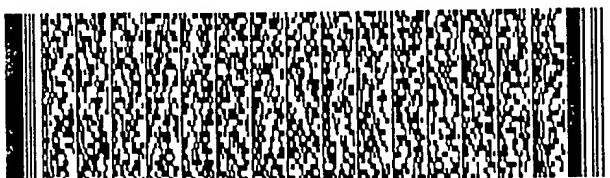
由於本發明的目的之一是使不具備螢幕顯示功能或微



五、發明說明 (4)

控制器的顯示器，也能達到自我測試的功能。例如當顯示器通過測試時，畫面會呈現一全白畫面以告知使用者或測試者顯示器可以正常運作，也就是說本發明中需要有一測試信號經由顯示器可顯示出類似全白影像畫面信號所能顯示出之全白畫面的效果。然而，本發明之顯示器在進行自我測試時，和電腦主機 16 是處於離線 (off-line) 的狀態，因此，此一可顯示出全白畫面之測試信號就不會是來自於電腦主機 16，而必須是顯示器 10 內部所產生者。而由於顯示器 10 中用來控制顯示電路 14 之一控制信號 H-BLANK 信號剛好和可顯示出全白畫面之全白影像畫面信號相似，因此可以利用此一現成的 H-BLANK 信號來作為本發明所需的測試信號。

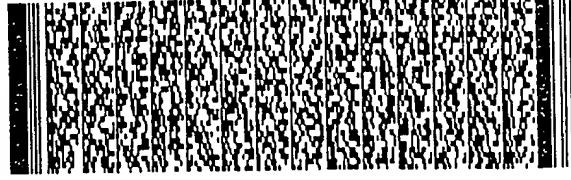
請參考圖四。圖四為 H-BLANK 信號與全白影像畫面信號之示意圖。H-BLANK 信號 23 為顯示器 10 於水平掃瞄期間用來指示何時可以顯示影像畫面的控制信號，其波峰與波峰間之振幅約為 5 伏特，工作週期約為 83%~90%，而一個全白的影像畫面信號 27 其波峰與波峰間之振幅約為 0.7 伏特，工作週期 (Duty Cycle) 約為 75%~80%，由圖四可看出 H-BLANK 信號 23 的波形和全白影像畫面信號 27 的波形十分相似。由於工作週期的差別並不會影響自我測試電路 20 的操作，而振幅的差別則可以以簡單的電阻分壓方式來縮小或調整 H-BLANK 信號 23 的振幅，因此，可以利用此一現成的 H-BLANK 信號來作為本發明所需的測試信號，在顯示



五、發明說明 (5)

器 10 通過測試時顯示一全白畫面於顯示幕 12 上。也就是說，本發明可以利用 H-BLANK 信號 23 模擬出 R1、G1、B1、CLAMP 等影像畫面信號，來分別或同時輸出至顯示電路 14。如果顯示器 10 可以正常運作，則當該測試信號所產生的 R1、G1、B1、CLAMP 等影像畫面信號分別單獨輸出至顯示電路 14 時，顯示幕則會對應產生 R、G、B 之畫面，而當模擬之 R1、G1、B1、CLAMP 等影像畫面信號同時輸出至顯示電路 14，在顯示幕 12 上呈現一全白畫面 (full-white picture)，本發明之實施例係以後者為例加以說明，然不以此為限。

如圖三所示，自我測試電路 20 之偵測電路 26 包含有一第一電晶體 28，以及一第二電晶體 30。開關電路 24 包含有一第三電晶體 32 以形成一控制端。當連接裝置 18 與電腦主機 16 連接時，連接裝置 18 的 EPS1 接腳 25 會呈現接地狀態 (grounded)。由於 EPS1 接腳 25 連接於第一電晶體 28 的基極，因此當 EPS1 接腳 25 呈現接地狀態時，第一電晶體 28 的基極會是低電位，使得第一電晶體 28 導通。由於第一電晶體 28 連接於第二電晶體 30 的基極，因此當第一電晶體 28 導通時，第二電晶體 30 的基極會是高電位，使得第二電晶體 30 無法導通。因此，開關電路 24 的第三電晶體 32 也不會導通，使得電源 29 無法經過第三電晶體 32。因此，測試信號產生器 22 所產生之測試信號無法經由開關電路 24 而輸出至顯示電路 14。



五、發明說明 (6)

當連接裝置 18 未與電腦主機 16 連接時，連接裝置 18 的 EPS1 接腳 25 會呈現浮接狀態 (floating)。由於 EPS1 接腳 25 連接於第一電晶體 28 的基極，因此當 EPS1 接腳 25 呈現浮接狀態時，第一電晶體 28 的基極會是高電位，使得第一電晶體 28 不導通。由於第一電晶體 28 連接於第二電晶體 30 的基極，因此當第一電晶體 28 不導通時，第二電晶體 30 的基極會是低電位，使得第二電晶體 30 導通。因此，開關電路 24 的第三電晶體 32 也會導通，使得電源 29 可以經過第三電晶體 32。因此，測試信號產生器 22 所產生之測試信號可以經由開關電路 24 而輸出至顯示電路 14。因此，偵測電路 26 以控制開關電路 24 之控制端，也就是電晶體 32，的開啟或關閉，來決定 H-BLANK 測試信號可否輸出至顯示電路 14 之輸入端。

請參考圖五。圖五為本發明以 H-BLANK 信號模擬影像畫面信號而產生影像畫面之流程圖 40。包含有下列步驟：

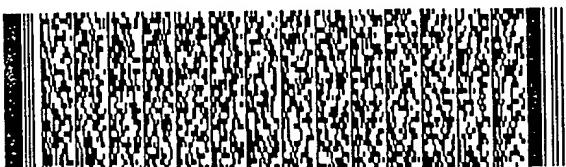
步驟 42：開始；

步驟 44：偵測電路 26 偵測電腦主機 16 是否有信號傳來，以判斷顯示器 10 是否與電腦主機 16 連線？連線建立，至步驟 46，連線未建立，至步驟 52；

步驟 46：連接裝置 18 的 EPS1 接腳 25 呈現接地狀態；

步驟 48：開關電路 24 之電晶體 32 關閉；

步驟 50：H-BLANK 信號無法經由電晶體 32 輸出至顯示



五、發明說明 (7)

電路 14 之 輸入端，至步驟 62；

步驟 52：連接裝置 18 的 EPS1 接腳 25 會呈現浮接狀態；

步驟 54：開關電路 24 之 電晶體 32 開啟；

步驟 56：H-BLANK 信號之振幅作適當調整；

步驟 58：調整後的 H-BLANK 信號經由電晶體 32 輸出至顯示電路 14 之 輸入端；

步驟 60：顯示幕 12 顯示全白之影像畫面；

步驟 62：結束。

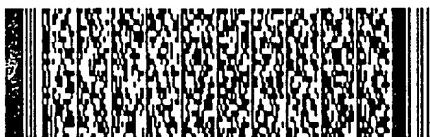
相較於習知顯示器，本發明顯示器 10 包含有一自我測試電路 20，用來測試顯示器 10 是否可以正常運作。自我測試電路 20 是利用影像畫面信號 (IBM VGA 信號) 所包含的 EPS1 子信號，以及測試信號產生器 22 所產生的測試信號 (H-BLANK 信號) 來進行自我測試之功能。當使用者想要知道顯示器 10 是否可以正常運作時，使用者可以將顯示器 10 不連接於一電腦主機，使得偵測電路 26 無法偵測到電腦主機 16 所傳來之影像畫面信號，因此，測試信號 (H-BLANK 信號) 會經由開關電路 24 輸出至顯示電路 14。如果顯示器 10 可以成功顯示一全白畫面 (full-white picture)，則表示顯示器 10 可以正常運作。

因此，本發明顯示器 10 無須具有螢幕顯示功能以及微控制器，就能達到自我測試的功能。



五、發明說明 (8)

以上所述僅為本發明之較佳實施例，凡依本發明申請專利範圍所做之均等變化與修飾，皆應屬本發明專利之涵蓋範圍。



圖式簡單說明

圖示之簡單說明

圖一為本發明顯示器之功能方塊圖。

圖二為連接裝置及其接腳定義之示意圖。

圖三為圖一自我測試電路之示意圖。

圖四為 H-BLANK信號與全白影像畫面信號之示意圖。

圖五為本發明以 H-BLANK信號模擬影像畫面信號而產生影像畫面之流程圖。

圖示之符號說明

10	顯示器	12	顯示幕
14	顯示電路	16	電腦主機
18	連接裝置	20	自我測試電路
22	測試信號產生器	23	H-BLANK信號
24	開關電路	25	EPS1接腳
26	偵測電路	27	全白影像畫面信號

六、申請專利範圍

1. 一種顯示器，其包含有：

一顯示幕，用來顯示影像畫面；

一顯示電路，用來將一電腦主機所傳來之影像畫面信號轉換成一影像畫面並將其顯示於該顯示幕上；

一連接裝置，電連接於該顯示電路之輸入端，用來接收該電腦主機所傳來之影像畫面信號；以及

一自我測試電路，電連接於該顯示電路之輸入端，其包含有：

一測試信號產生器，用來產生一可測試該顯示器的測試信號；

一開關電路電連接於該測試信號產生器之輸出端與該顯示電路之輸入端之間，用來控制該測試信號之輸出，以及

一偵測電路，電連接於該開關電路之控制端，用來偵測該電腦主機是否有信號傳來，以控制該開關電路之開啟或關閉；

其中當該偵測電路偵測到該電腦主機所傳來之影像畫面信號時，該偵測電路會關閉該開關電路而使該測試信號產生器所產生之測試信號無法輸出至該顯示電路之輸入端，而當該偵測電路未偵測到該電腦主機所傳來之影像畫面信號時，該偵測電路會開啟該開關電路而使該測試信號產生器所產生之測試信號得以傳入該顯示電路。

2. 如申請專利範圍第1項之顯示器，其中該連接裝置為



六、申請專利範圍

一 D15連接器。

3. 如申請專利範圍第1項之顯示器，其中該電腦主機所傳來之影像畫面信號為IBM VGA信號，其內含有一EPS1子信號，該連接裝置對應於該EPS1子信號之接腳為一EPS1接腳，當該電腦主機所傳來之影像畫面信號傳至該連接裝置時，該EPS1接腳會呈現接地狀態(grounded)，因此該偵測電路會關閉該開關電路，而當該電腦主機沒有信號傳至該連接裝置時，該EPS1接腳會呈現浮接狀態(floating)，因此該偵測電路會開啟該開關電路，而使得該測試信號產生器所產生之測試信號得以傳入該顯示電路。

4. 如申請專利範圍第1項之顯示器，其中當該測試信號產生器所產生之測試信號傳入該顯示電路時，該顯示電路會將其轉換成一測試畫面並將其顯示於該顯示幕上。

5. 一種設置於一顯示器內並對其進行測試之自我測試電路，該顯示器包含有一顯示幕，用來顯示影像畫面，一顯示電路，用來將一電腦主機所傳來之影像畫面信號轉換成一影像畫面並將其顯示於該顯示幕上，一連接裝置，電接於該顯示電路之輸入端，用來接收該電腦主機所傳來之影像畫面信號，該自我測試電路係電連接於該顯示電路之輸入端並包含有：

一測試信號產生器，用來產生一可測試該顯示器的測

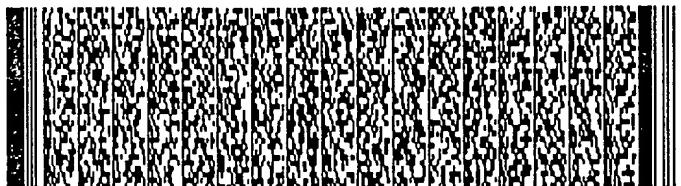
六、申請專利範圍
試信號；

一開關電路，電連接於該測試信號產生器之輸出端與該顯示電路之輸入端之間，用來控制該測試信號之輸出；以及

一偵測電路，電連接於該開關電路之控制端，用來偵測該電腦主機是否有信號傳來，以控制該開關電路之開啟或關閉；

其中當該偵測電路偵測到該電腦主機所傳來之影像畫面信號時，該偵測電路會關閉該開關電路而使該測試信號產生器所產生之測試信號無法輸出至該顯示電路之輸入端，而當該偵測電路未偵測到該電腦主機所傳來之影像畫面信號時，該偵測電路會開啟該開關電路而使該測試信號產生器所產生之測試信號得以傳入該顯示電路。

6. 如申請專利範圍第5項之自我測試電路，其中該電腦主機所傳來之影像畫面信號為IBM VGA信號，其內含有一EPS1子信號，該連接裝置對應於該EPS1子信號之接腳為一EPS1接腳，當該電腦主機所傳來之影像畫面信號傳至該連接裝置時，該EPS1接腳會呈現接地狀態(grounded)，因此該偵測電路會關閉該開關電路，而當該電腦主機沒有信號傳至該連接裝置時，該EPS1接腳會呈現浮接狀態(floating)，因此該偵測電路會開啟該開關電路，而使得該測試信號產生器所產生之測試信號得以傳入該顯示電路。



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7. 如申請專利範圍第5項之自我測試電路，其中該開關電路之控制端係為一電晶體，該偵測電路係以控制該電晶體之開啟或關閉，來決定該測試信號可否輸出至該顯示電路之輸入端。

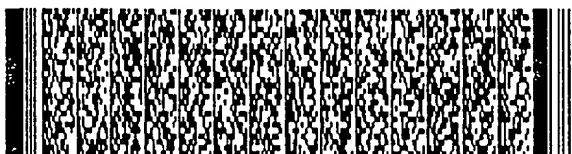
8. 一種於一顯示器中以H-BLANK信號模擬影像畫面信號而產生影像畫面之方法，該顯示器包含有一顯示幕，用來顯示影像畫面，一顯示電路，用來將一電腦主機所傳來之影像畫面信號依序轉換成相對應之水平影像掃瞄線，該顯示電路並依據一H-BLANK信號以決定何時將一水平影像掃瞄線顯示於該顯示幕上，以使複數條水平影像掃瞄線得以形成一相對應之影像畫面；

該方法包含有下列步驟：

偵測該電腦主機是否有信號傳來，以判斷該顯示器是否與該電腦主機連線；以及

當該顯示器未與該電腦主機連線時，將該H-BLANK信號之振幅作適當調整並輸入至該顯示電路，以模擬該電腦主機所傳來之影像畫面信號並產生相對應之影像畫面。

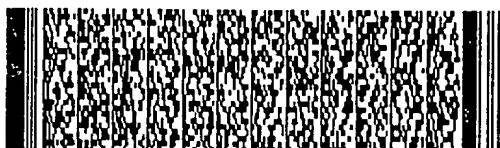
如申請專利範圍第8項之方法，其中該顯示器更包括有一開關電路，該H-BLANK信號並會經由該開關電路以傳送至該顯示電路之輸入端，當偵測到該電腦主機有信號傳來時，該開關電路會被關閉以使該H-BLANK信號無法輸出

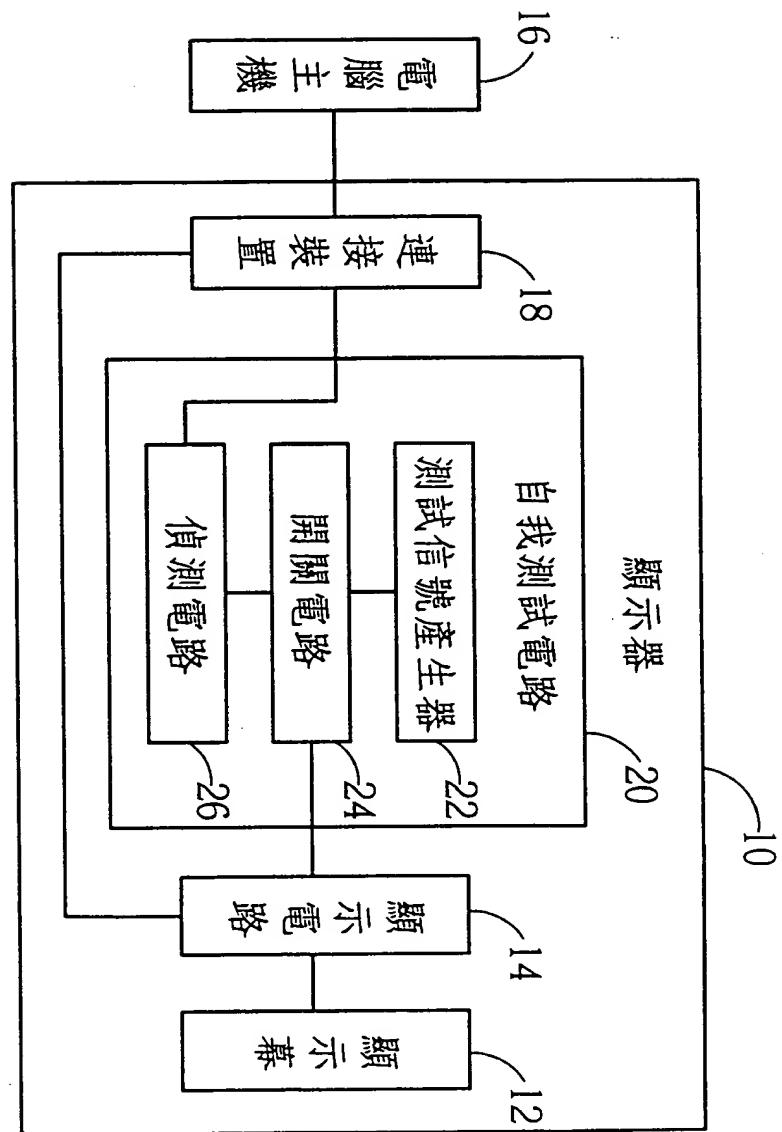


六、申請專利範圍

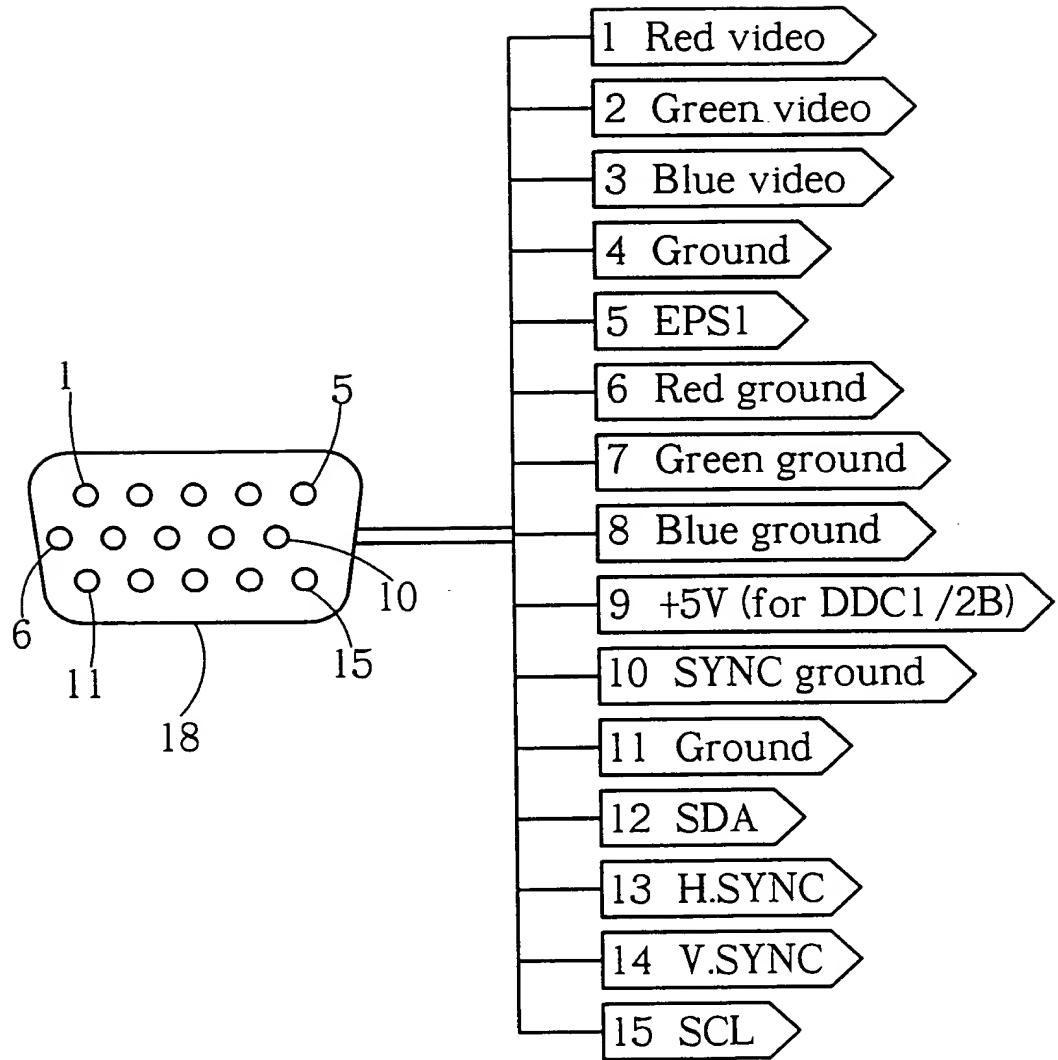
至該顯示電路之輸入端，反之，該開關電路會被開啟以使該H-BLANK信號輸出至該顯示電路之輸入端。

10. 如申請專利範圍第8項之方法，其中該H-BLANK信號之波形係和一全白影像畫面信號之波形相似，因此當該H-BLANK信號被輸入至該顯示電路之輸入端時，該顯示幕會顯示一全白影像畫面。

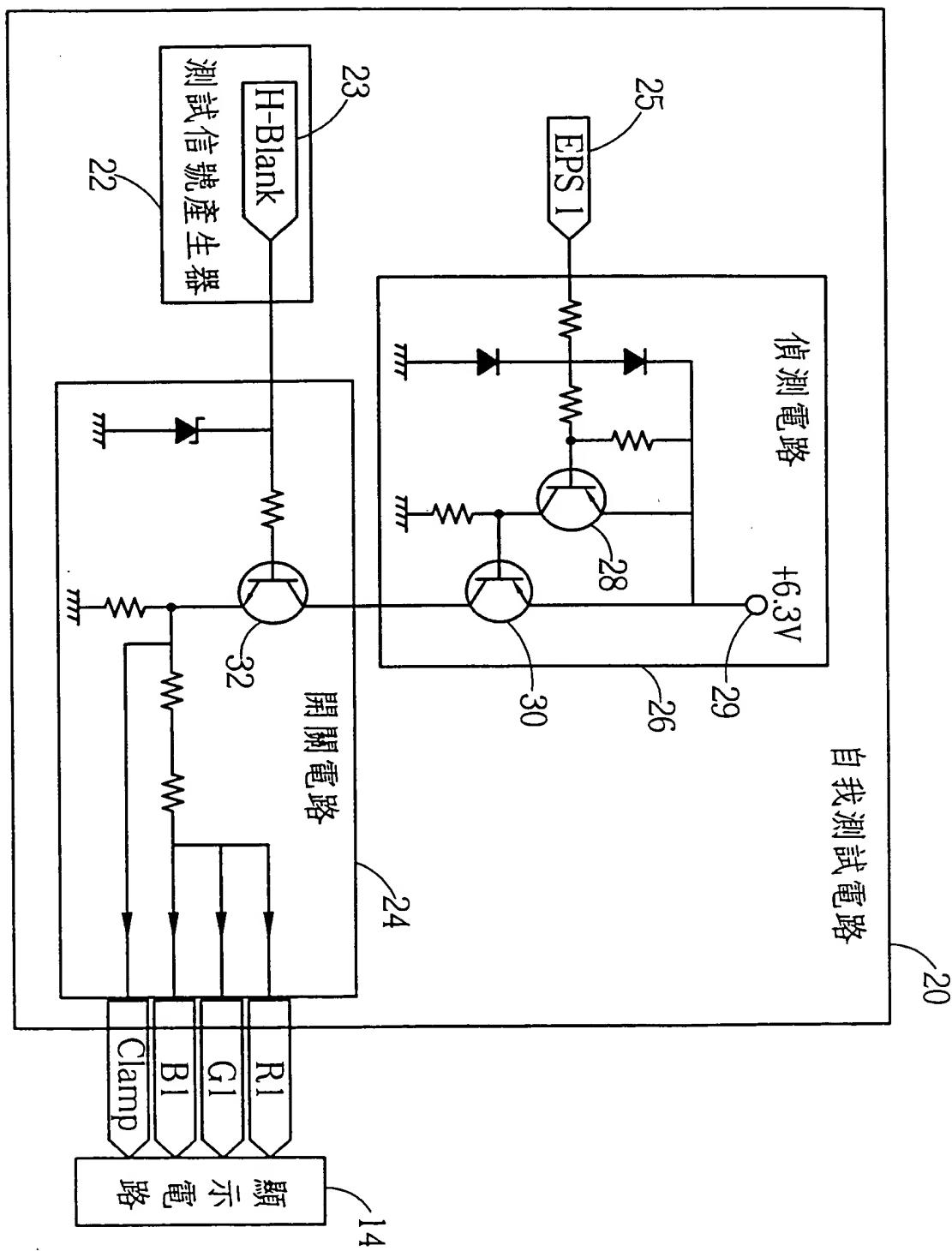




圖一

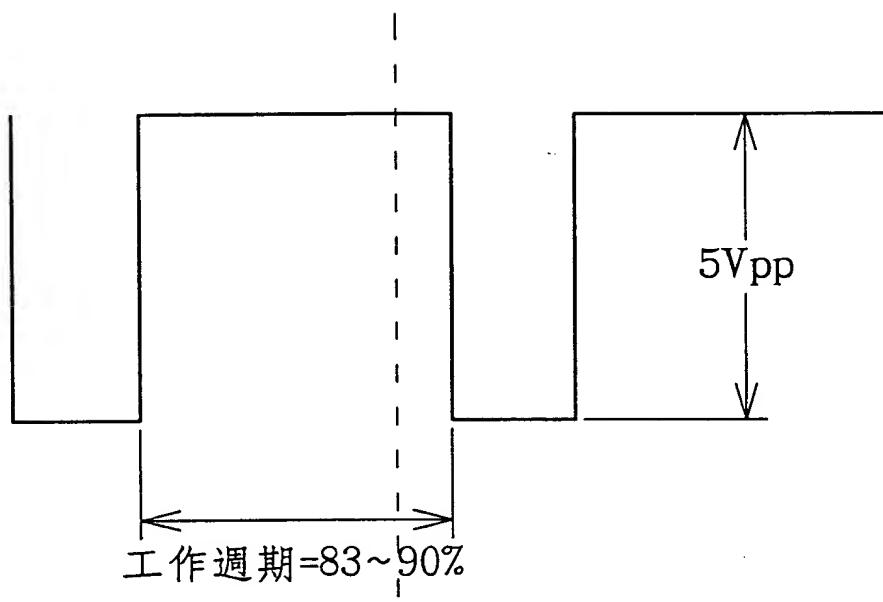


圖二

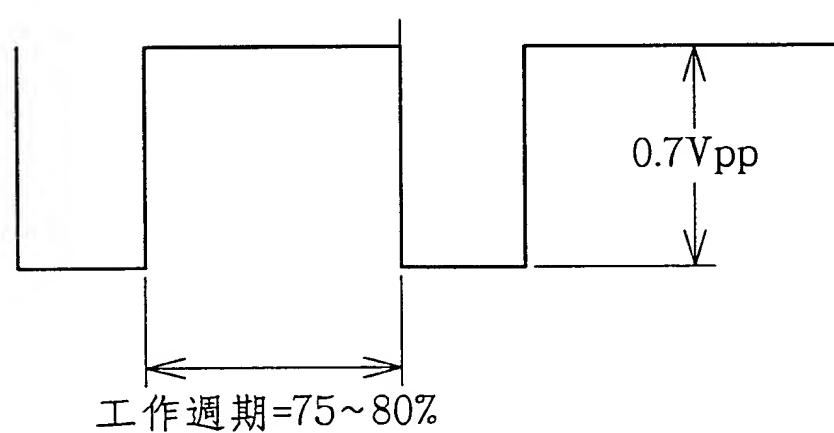


四
三

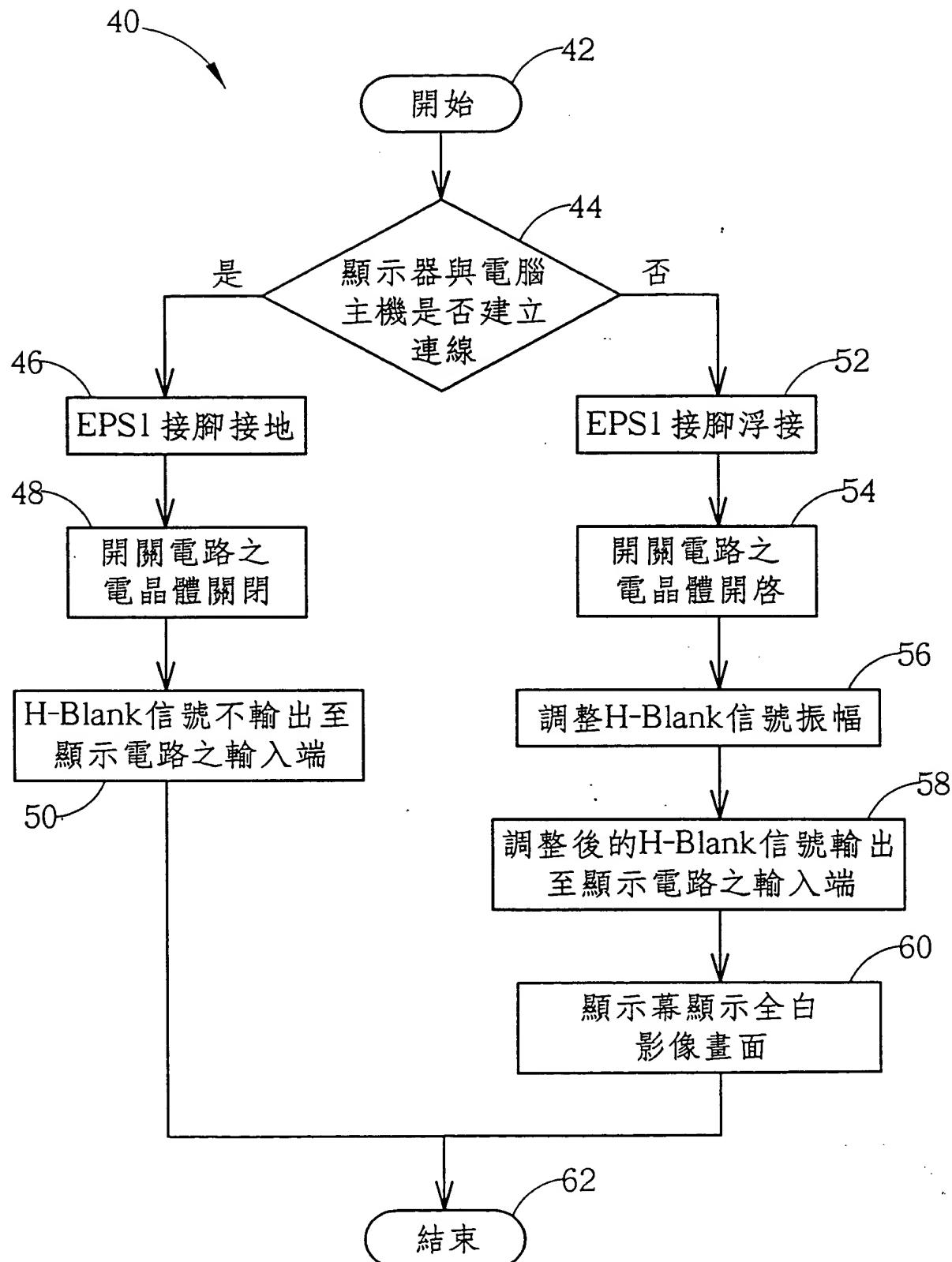
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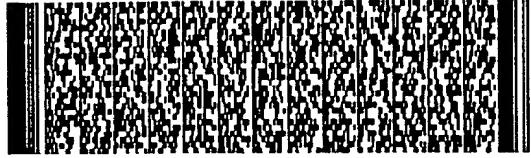


圖四

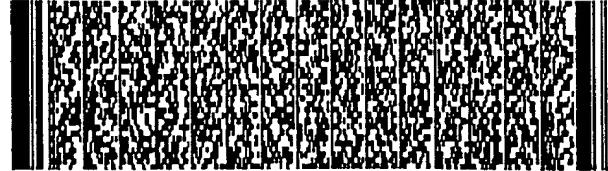


圖五

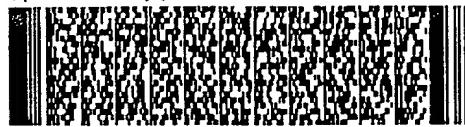
第 1/18 頁



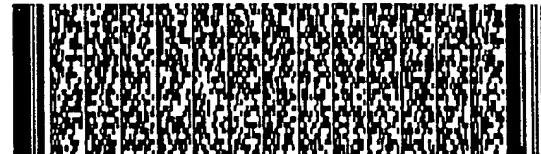
第 2/18 頁



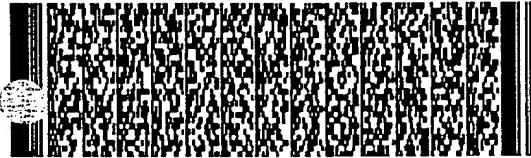
第 3/18 頁



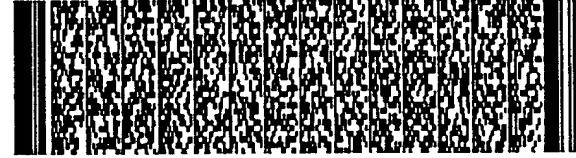
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第 5/18 頁



第 6/18 頁



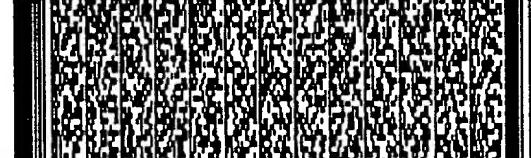
第 6/18 頁



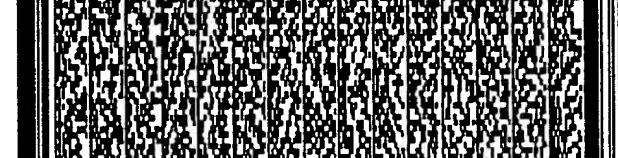
第 7/18 頁



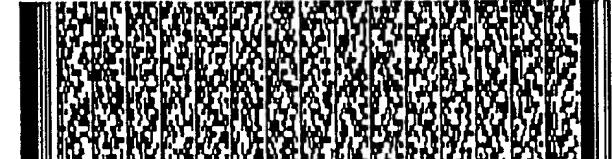
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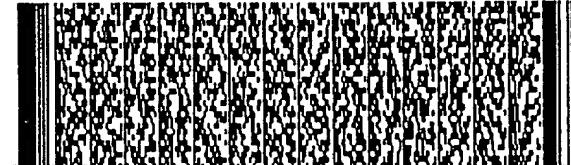
第 8/18 頁



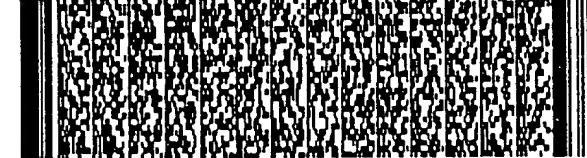
第 9/18 頁



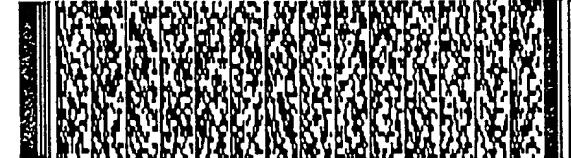
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第 10/18 頁



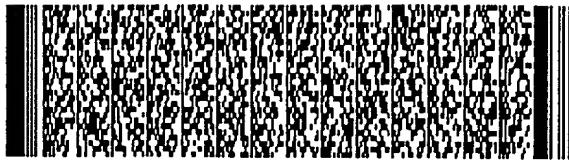
第 10/18 頁



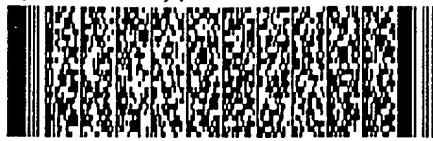
第 11/18 頁



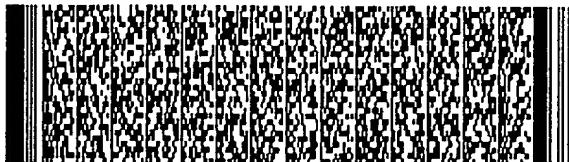
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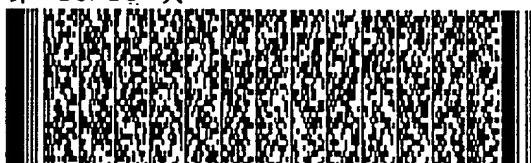
第 14/18 頁



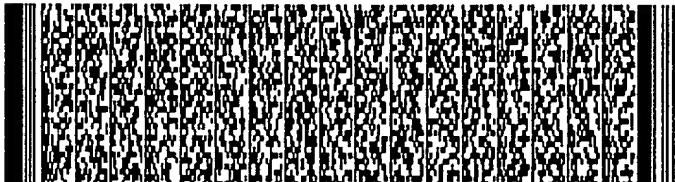
第 15/18 頁



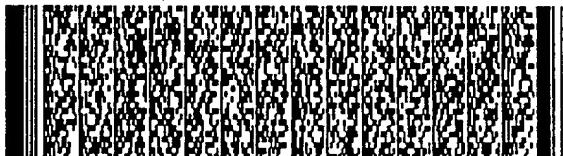
第 15/18 頁



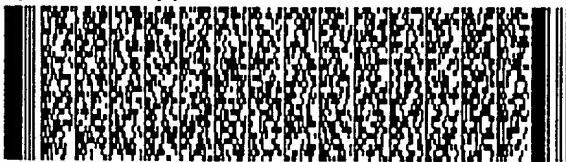
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Description*Cite-1 (English Version)*

Apparatus comprising a display screen which is active in the operating mode and in the standby mode.

The invention relates to an apparatus which comprises switching means for switching the apparatus between an operating mode and a standby mode, a display screen, and picture generating means for generating a picture on the display screen in the standby mode.

When the apparatus is a PC (Personal Computer) operating on the basis of the Microsoft Windows program, for example it is known to switch over from the operating mode to a standby mode if no operations are to be executed via the keyboard for a time interval of predetermined duration. The standby mode is in that case a so-called "screen saving" mode in which the picture is, for example darkened or changes in the course of time in order to prevent burning in of the display screen.

It is inter alia an object of the invention to provide an apparatus which is more attractive to the consumer in the standby mode and which provides an alternative method of changing the picture.

The apparatus in accordance with the invention is characterized in that it comprises measuring means for measuring a value of a parameter of an environment of the apparatus, coupled to the picture-generating means, in order to change a picture composition in the standby mode in response to a change of the measured value. The parameter of the environment is preferably chosen so that the user of the apparatus can directly influence this parameter (by way of normal physical expressions which are not specifically aimed at control members for the operating mode of the apparatus). This concerns more than changes due exclusively to the elapsing of time. Thus, the apparatus is prevented from monotonously displaying the same picture in the standby mode. The user can (possibly subconsciously) induce a change of the composition of the picture while the apparatus remains in the standby mode.

An embodiment of the apparatus in accordance with the invention is characterized in that the parameter is a sound signal. Notably a sound signal can be simply influenced by the user in a variety of ways, so that a variety of changes of the picture composition are possible in response thereto.

An embodiment of the apparatus in accordance with the invention is characterized in that the measuring means are arranged to measure at least one of the following properties of the sound signal: a volume a a pitch - a frequency at which maxima occur in the volume, and that the picture-generating means are arranged to change the picture composition in response to a change of at least one of said properties. Other feasible parameters are for example an ambient temperature, an ambient light intensity, a spectral composition of the ambient light, etc.

An embodiment of the apparatus in accordance with the invention is characterized in that the measuring means are arranged to measure at least two of said properties of the sound signal, and that picture-generating means are arranged to induce a unique, respective change of the picture composition in response to a change of each of the measured properties. By coupling a unique type of response to each type of change, a varied picture change is achieved.

An embodiment of the apparatus in accordance with the invention is characterized in that the picture-generating means are arranged to change at least one of the following picture characteristics in response to the change of the measured value: - a colour contents - a size of objects displayed a number of objects displayed.

For example, a change of size can be coupled to a change of sound volume, a change of colour can be coupled to a change of frequency, and another change can be coupled to a change of pitch. Other combinations, however, are also feasible. The user himself may even be allowed to adjust the combinations to be used.

The invention is particularly suitable for use in a television receiver; this receiver will usually be switched between the operating mode and the standby mode by the user. The invention, however, can also be used in other apparatus, not only for screen saving purposes but also for energy saving purposes when a part of the apparatus which is normally supplied with energy in the operating mode is not supplied with energy or with less energy, in the standby mode. Generally speaking, in the standby mode an essential part of the apparatus, for example the receiving section, is substantially inactive in the function for which it is provided (for example, supplying the display screen with supplied information and/or information explicitly selected by the user).

These and other aspects of the invention and its advantages will be described in detail hereinafter with reference to the Figures; therein:

Fig. 1 shows an apparatus in accordance with the invention, and
Fig. 2 shows an example of a picture composition.

The Figure shows, by way of example, an apparatus 1 in the form of a television receiver. The receiver comprises a receiving and decoding section 10 with an input and an output. The receiver 1 also comprises a microphone 15 which is coupled to a measuring unit 16 which itself is coupled to picture-generating means 17. The output of the picture-generating means 17 and that of the receiving and decoding section 10 are coupled to a switch 12 which optionally connects one of the two outputs to picture display means 14.

The picture display means comprise a display screen 18. The switch 12 is controlled by a control unit 13.

During operation, the control unit 13 receives switching commands, for example from a remote control, in response to which the control unit 13 can switch the switch 12 to and fro between a first position (not shown), in which the output of the receiving and decoding section 10 is coupled to the picture display means 14, and a second position in which the output of the picture-generating means 17 is coupled to the picture display means 14. The first position corresponds to the operating mode of the apparatus 1 whereas the second position corresponds to the standby mode.

in the operating mode the apparatus acts as a television receiver and the display means 14 display, on the display screen 18, video signals received on the input of the receiving and decoding unit 10 (for example, from an aerial, a cable television connection, or a video recorder, etc.).

In the standby mode the display means 14 display a picture on the display screen 18 which has been generated by the picture-generating means 17. The picturegenerating means 17 comprise, for example a processor (not shown) which executes a graphics program so as to generate the picture. The graphics program provides, for example a picture which comprises a number of circular discs of different colour, diameter and position.

The microphone 15 picks up sound from the environment of the apparatus 1 and hence forms a signal which is applied to the measuring unit 16. The measuring unit determines a number of properties of this signal, for example the volume (the amplitude of the signal averaged over a predetermined period of, for example 1 second), the pitch (for example, the period duration between successive zero crossings of the signal), and the peak frequency, i.e. the inverse of the distance in time between instants at which maxima occur in the volume as a function of time.

The measured values of these properties are applied to the picturegenerating means 17 which generate the picture in dependence on the measured values.

Fig. 2 shows an example of a composition of a picture 20. For example, each time when a peak occurs in the sound signal, the picture-generating means 17 add to the picture 20 a circular disc 22a-d of a size which is proportional to the sound volume and of a colour of a wavelength which is proportional to the pitch. A circular disc is omitted again some time after having been generated.

It will be evident that this picture 20 is given merely by way of example and that numerous other types of pictures are feasible which can all be made dependent on the measured properties of the sound signal. For example, instead of using graphically generated pictures of circular segments, use can be made of a graphics system which executes graphic commands which result in a generated picture, the graphics commands (for example outline descriptions as in the language Postscript (R) by Adobe (R), or graphics commands such as available within Windows (R) by Microsoft (R)), being stored in advance in a memory and being supplemented in dependence on the properties of the sound signal (for example with position, colour, rotation or scale commands).

Furthermore, use can be made of a sprite (a bit map of a partial image representing an object) which is stored in a memory, for example a sprite of an animal. For generating the contents of this sprite are then reproduced in the image. Examples of selectable image characteristics are then the choice between different sprites stored in the memory (for example, of different animals), the size of display, colour, speed, direction and path of movements in the image, in dependence on the measured value of the parameter of the environment, for example the sound signal. Use can also be made of pictures of landscapes, as a background, or to introduce changes (seasonal effects, weather conditions, etc.), in dependence on the measured value of the parameter of the environment. Numerous other possibilities also exist.

Preferably, the changes in the composition of the picture concern incremental changes, which means that not each time a new picture is generated whose composition is not related to the previous picture, but that picture is only partly changed each time.

The pictures and the way in which they depend on the parameters of the environment can also be automatically changed by the apparatus in the course of time (for example, after a period of hours or weeks), or be changed by the user. Thus, the type of sprite or the relationship between the picture characteristics and the properties of the parameter of the environment can be made variable.

Even though the invention is notably suitable for television receivers and monitors for picture reproduction apparatus, and has also been described in this context, it can also be used for other equipment such as personal computers. Instead of the microphone 15 for measuring a sound signal, other types of sensor can be used, for example sensors for measuring other parameters of the environment, such as temperature, ambient light, motions in the environment etc. Such sensors can also be used in combination or together with a microphone so as to initiate a respective unique change in the picture.

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Claims

CLAIMS:

1. An apparatus which comprises switching means for switching the apparatus between an operating mode and a standby mode, a display screen, and picture generating means for generating a picture on the display screen in the standby mode, characterized in that the apparatus comprises measuring means for measuring a value of a parameter of an environment of the apparatus, coupled to the picture-generating means, in order to change a picture composition in the standby mode in response to a change of the measured value.
2. An apparatus as claimed in Claim 1, characterized in that the parameter is a sound signal.
3. An apparatus as claimed in Claim 2, characterized in that the measuring means are arranged to measure at least one of the following properties of the sound signal:
a volume
a pitch
a frequency at which maxima occur in the volume and that the picture-generating means are arranged to change the picture composition in response to a change of at least one of said properties.
4. An apparatus as claimed in Claim 3, characterized in that the measuring means are arranged to measure at least two of said properties of the sound signal, and that picture-generating means are arranged to induce a unique, respective change of the picture composition in response to a change of each of the measured properties.
5. An apparatus as claimed in any one of the Claims 1 to 4, characterized in that the picture-generating means are arranged to change at least one of the following picture characteristics in response to the change of the measured value: - a colour contents - a size of objects displayed
a number of objects displayed.
6. An apparatus as claimed in any one of the Claims 1 to 5, characterized in that it constitutes a television receiver arranged to display an externally received video signal on the display screen in the operating mode.

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